

Work Order ID 84677

84677

Page 1

Rev-30-12 3:48:45 PM

Duplicate

Item ID: D350-748-241TRN

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Crosstube Turning Detail

Start Date: 17/05/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 22/05/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: MLJ

Date: 12/05/31

Tooling:

Date:

Run Start *NR1*

QC:

Date:

SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
----------	--------------

D350-748-241	F
--------------	---

100

0.00

100

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs on both ends as per Folio FA647

2-Turn first side as per Folio FA647

3- File transition lines smooth.

FOLIO REV: _____

DWG REV: F

mm.l
12/07/11

110

QC1- Inspect dimensions to dimension sheet

0.00

110

QC

Memo

0.00

Quality Control

mm.l
12/07/11

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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May-30-12 3:48:45 PM

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Page 2

Item ID: D350-748-241TRN

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Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120		0.00							
120	MORI SEIKI CNC LATHE LARGE								
Mori Seiki	Memo	0.00							
Mori Seiki CNC Lathe Large	1-Turn second side as per Folio FA647 2- File transition lines smooth. 3-Scribe part # as per Dwg D350-748-241 FOLIO REV: _____ DWG REV: _____								
130		0.00							
130	QC1- Inspect dimensions to dimension sheet								
QC	Memo	0.00							
Quality Control									
140		0.00							
140	QC8- Inspect parts - second check								
QC	Memo	0.00							
Quality Control									

DAS
203
88

DP

12-7-23

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150		0.00							
150	Large Fab								
Crosstubes									
Crosstubes	Memo	0.00							
	1-DRILL HOLES FOR HEAT TREAT USING DT9806(HOLES MUST BE ALIGNED ON SAME LINE ON BOTH CUFFS)								- DC 12/07/24
	2-Grind machining marks								Mo 12-7-30
160	Outsource process - Heat Treat	0.00							
160									
Outsource1									
Outsource process - Heat Treat	Memo	0.00							
	Issue P/O: 17601								
	Heat Treat to min 180 KSI As per Dwg D350-748-241								
	Sand Blast tube after Heat Treat								
	Possibe Supplier: Vac Aero								
	Ensure Certificate of Conformity is attached								
170	Receive & Inspect for Damage & Mat'l Certs	0.00							
170									
Packaging									
Packaging	Memo	0.00							
	Ensure certificate of conformaty is attached								

12-08-2

X

12-8-21

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Cust Item ID:

Required Date: 22/05/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start ***NR1***

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180 *180* QC Quality Control	QC6- Inspect dimensions to drawing Memo	0.00 0.00							P70 →
190 *190* Packaging Packaging	Packaging Memo Identify and stock in kanban rack Location: _____	0.00 0.00							JW 12-10-03
200 *200* QC Quality Control	QC21- Final Inspection - Work Order Release Memo	0.00 0.00							MLC 12-09-28 MLC 12-09-28

W/O: 84677		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

12-18-75
12-18-75

Part No: D350-748-241TR PAR #: _____ Fault Category: Rework NCR: Yes No DQA: 12/10/11 Date: 12/10/11
 Resolution: _____ Disposition: X-tube QA: N/C Closed: 12/10/11 Date: 12/10/11

NCR: 12-18-76		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
12/8/08	180	Tubes are not straight and are not sandblasted. R.C. symbol	DAS 16 3-8 052042 12/08/28	Build up Heat treating Scale before Bending	12-8-28	JW 12-8-28	DAS 16 3-8 052042 12/08/28	DAS 16 3-8 12/08/28

NOTE: Date & initial all entries

Picklist Print

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Page 1

Work Order ID: 84677

84677

Parent Item: D350-748-241TRN

D350-748-241TRN

Parent Item Name: Crosstube Turning Detail

Start Date: 17/05/2012

Required Date: 22/05/2012

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:A New Issue 08-03-06 DD verified by:ec
IPP Rev B Removed polish 08.04.02 EC verified by: DD
IPP Rev C Removed LPS-3 08.06.23 Ec verified by: DD IPP Rev D
11.02.24 as per dwg rev.F DD verf: JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6015-125		Manufactured	No			120	Each	38.0000	1	1			

D6015-125

Crosstube Material

**

Location

Loc Qty

Loc Code

HALL

38

61380

4

72511

34

1 manual 12/07/06

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	84677
Description: Crosstube Assembly (AS350/355 High Aft)		Part Number:	D350-748-241
Inspection Dwg: D350-748-241 Rev: F		Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000	2.244	✓		
	2.180	+0.005/-0.000	2.184	✓		
	2.180	+0.005/-0.000	2.185	✓		
	2.208	+0.005/-0.000	2.213	✓		
	2.234	+0.005/-0.000	2.235	✓		
	2.253	+0.005/-0.000	2.256	✓		
	2.272	+0.005/-0.000	2.277	✓		
	2.299	+0.005/-0.000	2.304	✓		
	0.063	+/-0.010	.063	✓		
	4.26	+/-0.030				
	R0.063	+/-0.010	.063	✓	R6	
	R0.50	+/-0.030			R6	
SIDE B	2.240	+0.005/-0.000	2.244	✓		
	2.180	+0.005/-0.000	2.185	✓		
	2.180	+0.005/-0.000	2.185	✓		
	2.208	+0.005/-0.000	2.213	✓		
	2.234	+0.005/-0.000	2.236	✓		
	2.253	+0.005/-0.000	2.256	✓		
	2.272	+0.005/-0.000	2.277	✓		
	2.299	+0.005/-0.000	2.305	✓		
	0.063	+/-0.010	.063	✓		
	4.26	+/-0.030	4.26	✓		
	R0.063	+/-0.010	.063	✓	R6	
	R0.50	+/-0.030	.50	✓	R6	
	122.70	+/-0.060	122.65	✓	TAPE	LG-22

Measured by: mmk/kc	Audited by: [Signature]	Preliminary Approval:
Date: 12/07/11	Date: 12-3-23	Date:

Rev	Date	Change	Revised by	Approved
A	07.01.17	New Issue (P/O D350-748-201)	KJ/JLM	
B	12.02.02	Dwg Rev updated	KJ	

W/O:		WORK ORDER CHANGES					
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Item	Qty -241	Part Number	Description
1	X	D350-748-241	CROSSTUBE ASSEMBLY (AS 350/355 HI AFT)
2	1	D6015-125	CROSSTUBE (OR D6018-125)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6018-125
FINISHED LENGTH = 122.700±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-241" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 29.85 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT ALL EDGES FROM MACHINING
LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER
BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO
VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE,
CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES,
NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY.
CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE
MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO
CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT
NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 15) MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN
CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 04677 MLJ
1205131

RELEASED
R 2011-07-08
WP

F	ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES; UPDATE TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A8-3); ADD TOLERANCES (ZN C6-3, D2-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6018-125 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	10.11.23		

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. REV. F
D350-748-241 SHEET 1 OF 4
TITLE SCALE
CROSSTUBE (AS 350/355 HI AFT) NTS

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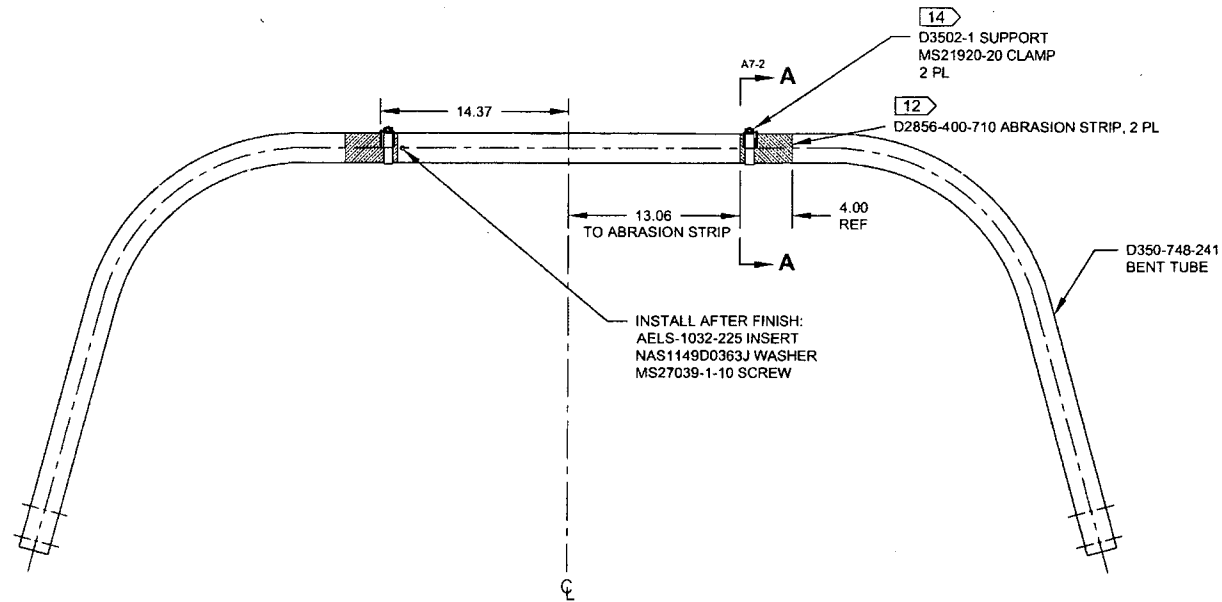
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

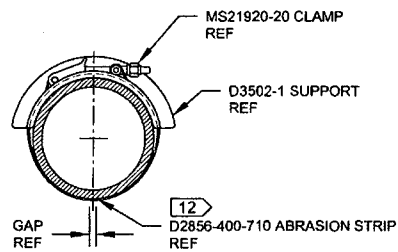
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries



**D350-748-241
ASSEMBLY DETAIL**



SECTION A-A D4-2
SCALE 4X

RELEASED
2011-05-19

DESIGN	9P	DART AEROSPACE LTD	
DRAWN	9P	HAWKESBURY, ONTARIO, CANADA	
CHECKED	13	DRAWING NO.	REV. F
MFG. APPR.	13	D350-748-241	SHEET 2 OF 4
APPROVED	14	TITLE	SCALE
DE APPR.	14	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	10.11.23	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD</small>	

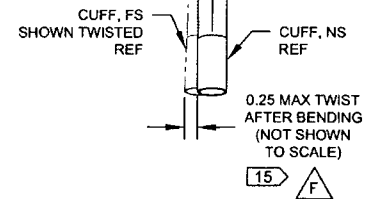
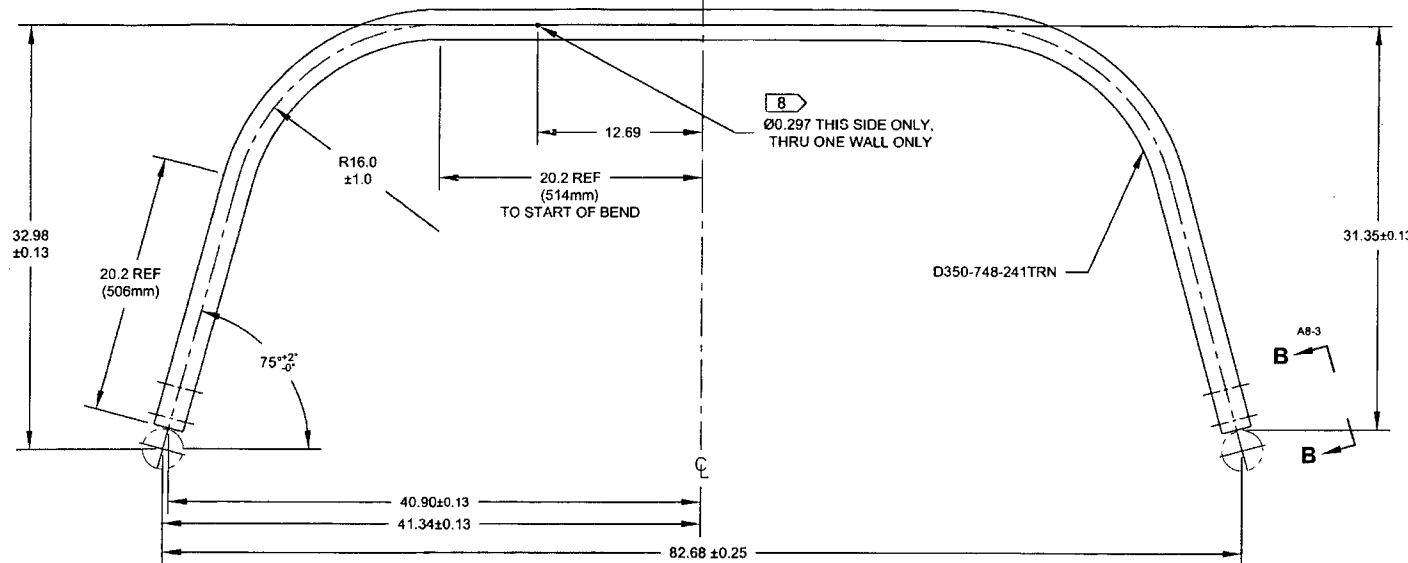
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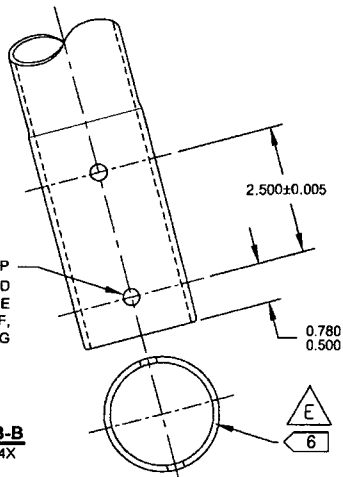
NOTE: Date & initial all entries



D350-748-241
BENDING AND DRILLING DETAIL 10

Ø0.323^{+0.005}_{-0.000} THRU, TYP
HOLE TO BE ALIGNED
WITHIN ±0.001 OF HOLE
ON OTHER SIDE OF CUFF,
TO BE DRILLED AFTER BENDING

C2-3 **VIEW B-B**
SCALE 4X



RELEASED
2011-01-18

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. F
MFG. APPR.		D350-748-241	SHEET 3 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI AFT)	NTS
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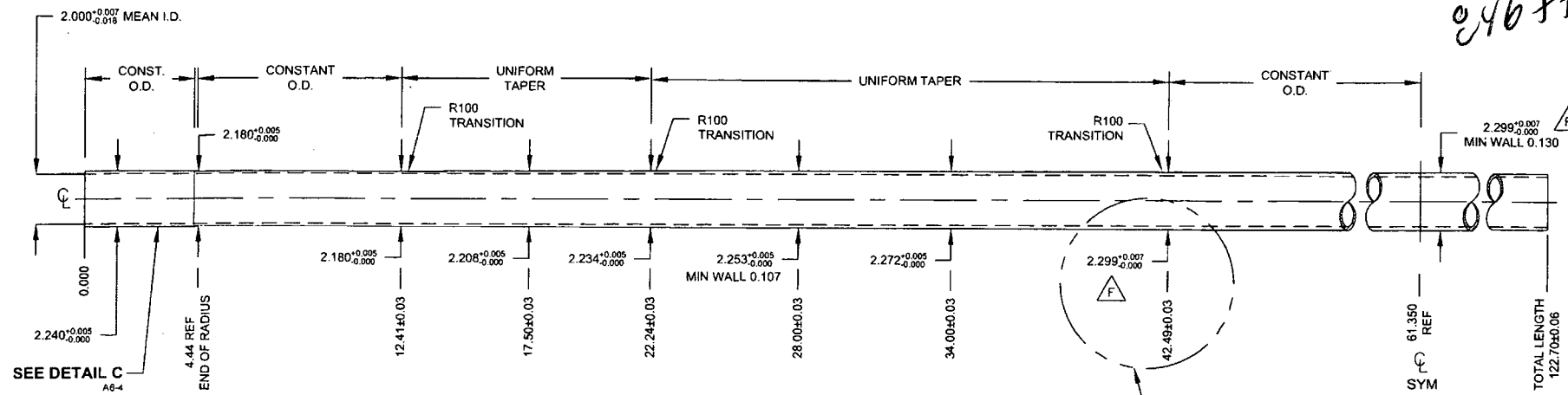
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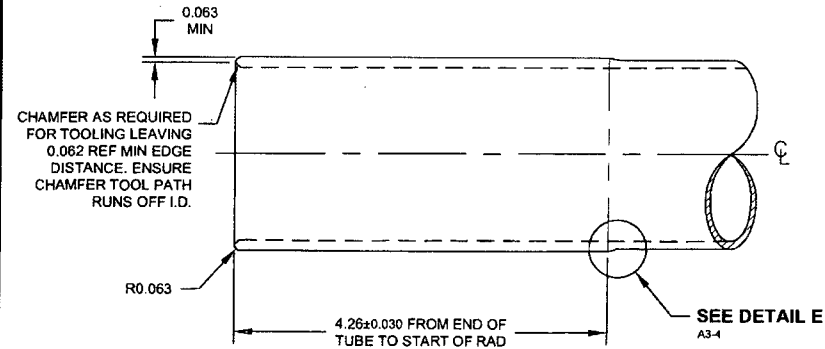
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24677

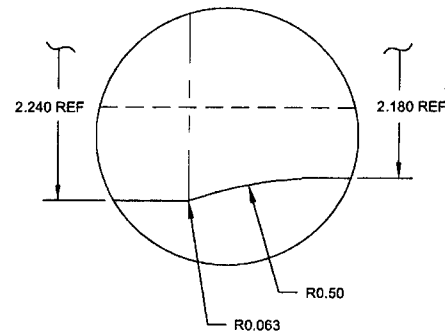


**D350-748-241TRN
TURNING DETAIL**

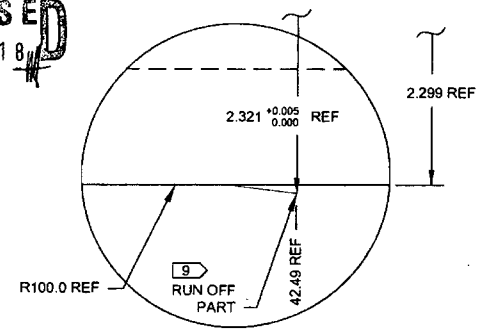
RELEASED
2011-01-18



**DETAIL C:
CROSSTUBE CUFF** C8-4
SCALE 3X



**DETAIL E:
CUFF TRANSITION** A5-4
NOT TO SCALE



**DETAIL D:
TAPER RUN-OFF** C3-4
NOT TO SCALE

DESIGN	90	DART AEROSPACE LTD	
DRAWN	90	HAWKESBURY, ONTARIO, CANADA	
CHECKED	90	DRAWING NO.	REV. F
MFG. APPR.	90	D350-748-241	SHEET 4 OF 4
APPROVED	90	TITLE	SCALE
DE APPR.	90	CROSSTUBE (AS 350/355 HI AFT)	NTS
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Dart Aerospace Ltd

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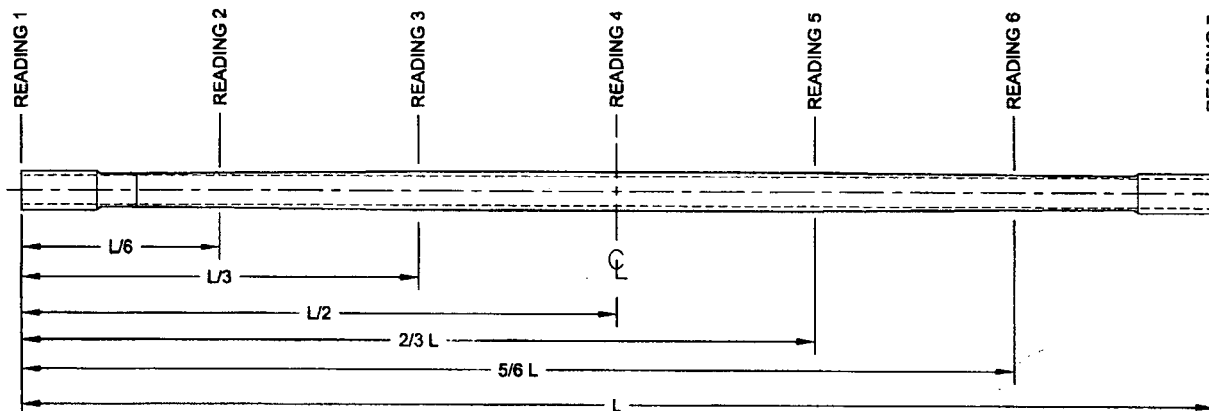
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NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order: EY672
Description: Crosstube Assembly (AS350/355 High Aft)	Part Number: D350-748-241
Inspection Dwg: D350-748-241 Rev: F	Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0" 20.50	.124	.118	.124	.130	.012	0.030"
READING 2 L= 4.125	.137	.130	.107	.111	.030	
READING 3 L= 6.541	.173	.165	.144	.154	.029	
READING 4 L= 10.15	.159	.157	.162	.165	.008	
READING 5 L= 16.2	.160	.153	.157	.167	.007	
READING 6 L= 102.5	.123	.109	.118	.137	.028	
READING 7 L= 172.7	.127	.120	.128	.135	.015	

Calibration Result

Actual Block Thickness: 100-200

Sitescan 250 Measured Thickness: 100-200

Measured by: KC
Date: 12-7-12

Accepted by: [Signature]
Date: 12-7-23

Preliminary Approval:
Date:

Rev	Date	Change	Revised by	Approved
A	07.01.17	New Issue (P/O D350-748-201)	KJ/JLM	
B	12.02.02	Dwg Rev updated	KJ	
C	12.06.04	Wall thickness form added	KJ	[Signature]

LAB
1000 E. MERMAID LANE
WYNDMOOR, PA 19038

Packing I

Sales Order Num

7

Sales Order

Aug 8,

Voice: 215-233-2600
Fax: 215-233-5653

Sold To:
DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:
DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO17601	Net 30 Days
Ship Via	Process	
R & L CARRIER		

Quantity	Item	Description	Total Shipped	This Shipm
1.00	✓	1 PC. 86987 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00	✓	1 PC. 86988 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00	✓	1 PC. 84668 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		

COMMENTS

SHIPPED BY, SIGNATURE
METLAB

DATE

RECEIVED BY, SIGNATURE
DART AEROSPACE

DATE

Packing L

Sales Order Nur

7:

Sales Order

Aug 8,

LAB

1000 E. MERMAID LANE
WYNDMOOR, PA 19038

Voice: 215-233-2600

Fax: 215-233-5653

Sold To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO17601	Net 30 Days
Ship Via	Process	
R & L CARRIER		

Quantity	Item	Description	Total Shipped	This Shipm
1.00	✓	1 PC. 84672 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00	✓	1 PC. 84669 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00	✓	1 PC. 84677 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 180 POUNDS TOTAL		

SEP 12-8-21

COMMENTS

SHIPPED BY, SIGNATURE
METLAB

DATE

RECEIVED BY, SIGNATURE
DART AEROSPACE

DATE



1000 E. Mermaid La., Wyndmoor (Phila.) PA 19038-8093
Tel. (215) 233-2600 Fax (215) 233-5653

Invoice

Invoice Num

0114

Invoice D

Aug 16, 20

Sold To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID		Customer PO		Payment Terms	
DARA		PO17601		Net 30 Days	
Shop Order No.		Shipping Method		Ship Date	Due Date
73369		R & L CARRIER		8/16/12	9/15/12
Quantity	Item	Description		Unit Price	Extens
1		1 PC. 86987 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		205.000	20
1		1 PC. 86988 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		205.000	20
1		1 PC. 84668 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		205.000	20
1		1 PC. 84672		205.000	20

ANY DISCREPANCIES MUST BE REPORTED WITHIN 10 DAYS AFTER RECEIPT.

We accept AMEX, Visa & Master Card



Heat Treating and Metallurgical Consulting

Subtotal	Contir
Shipping/Handling	
Total Invoice Amount	Contir
Payment Received	
TOTAL	Contir

Visit our Web Site: <www.thomasregister.com/metlab/>



1000 E. Mermaid La., Wyndmoor (Phila.) PA 19038-8093
Tel. (215) 233-2600 Fax (215) 233-5653

Invoice

Invoice Num

0114

Invoice D

Aug 16, 20

Sold To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID		Customer PO	Payment Terms	
DARA		PO17601	Net 30 Days	
Shop Order No.		Shipping Method	Ship Date	Due Date
73369		R & L CARRIER	8/16/12	9/15/12
Quantity	Item	Description	Unit Price	Extended Price
1		D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 1 PC. 84669	205.000	205.000
1		D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 1 PC. 84677	205.000	205.000
		D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 180 POUNDS TOTAL		

ANY DISCREPANCIES MUST BE REPORTED WITHIN 10 DAYS AFTER RECEIPT.

We accept AMEX, Visa & Master Card




Heat Treating and Metallurgical Consulting

Subtotal	1,23
Shipping/Handling	
Total Invoice Amount	1,23
Payment Received	
TOTAL	1,23

Visit our Web Site: <www.thomasregister.com/metlab/>

North American Free Trade Agreement Certificate of Origin

Please print or type

1. Exporter's Name and Address: Metlab 1000 E. Mermaid Lane Wyndmoor, PA 19038 Tax Identification Number: 23-2973306		2. Blanket Period: (dd/mm/yyyy) From: 01/01/2012 To: 31/12/2012			
3. Producer's Name and Address: Metlab 1000 E. Mermaid Lane Wyndmoor, PA 19038 Tax Identification Number: 23-2973306		4. Importer's Name and Address: Dart Aerospace 1270 Aberdeen Street Hawkesbury, ON K6A 1K7 CANADA Tax Identification Number:			
5. Description of Good(s)	6. HS Tariff Classification Number	7. Preference Criterion	8. Producer	9. Net Cost	10. Country of Origin
 Heat Treatment Services	 8483.401	 C	 Yes	 No	 USA
11. I CERTIFY THAT:					
<ul style="list-style-type: none"> * the Information on this document is true and accurate and I assume the responsibility for proving such representations. I understand that I am liable for any false statements or material omissions made on or in connection with this document; * I agree to maintain, and present upon request, documentation necessary to support this Certificate, and to inform, in writing, all persons to whom the Certificate was given of any changes that would affect the accuracy or validity of this Certificate; * the goods originated in the territory of one or more of the Parties, and comply with the origin requirements specified for those goods in the North American Free Trade Agreement, and unless specifically exempted in Article 411 or Annex 401, there has been no further production or any other operation outside the territories of the Parties; and * this Certificate consists of <u>One (1)</u> page, including all attachments. 					
Authorized Signature: 			Company: Metlab		
Name: Mark Podob			Title: Vice President		
Date: (mm/dd/yyyy) 8/16/2012		Telephone: 215-233-2600		Fax: 215-233-5653	



1000 E. Mermaid Ln., Wyndmoor (Phila.) PA 19038-8093
Tel. (215) 233-2600 Fax (215) 233-5663

ORDER ACKNOWLEDGEMENT

613 632 1053

E-MAILED TO: _____

FAXED TO: _____

QR-4.722-01

Rev A 5/10/10

CUSTOMER: <u>Dart Aerospace</u>	PO NUMBER: <u>P017601</u>
DATE MATERIAL RECEIVED: <u>8/8/2012</u>	METLAB QUOTE NUMBER: <u>N/A</u> Or, MINIMUM STD ORDER(CHECK)
ESTIMATED SHIP DATE: <u>8/15/12</u>	METLAB S.O. NUMBER: <u>73369</u>

THANK YOU FOR YOUR ORDER. WE WILL MAKE OUR BEST EFFORT TO SHIP YOUR ORDER ON OR BEFORE THE ESTIMATED SHIP DATE SHOWN ABOVE. IF YOU NEED TO CONTACT US REGARDING THIS ORDER, PLEASE REFERENCE THE METLAB S.O. NUMBER SHOWN ABOVE.

QUOTATION MISSING? ☒ OK TO PROCESS WITHOUT DA

PURCHASE ORDER MISSING? _____ OK TO START PROCESSING WITHOUT _____

NOTE THAT WE NEED THE FOLLOWING INFORMATION IN ORDER TO COMPLETE YOUR ORDER AND TO MEET THE PROMISED SHIP DATE:

TECHNICAL INFORMATION REQUIRED(LIST) : _____ ON HOLD : YES _____ NO _____

OTHER INFORMATION OR CLARIFICATION: _____ ON HOLD : YES _____ NO _____

RELEASED FOR PROCESSING BY: DA DATE: 8/8/12

ACKNOWLEDGED BY: _____

TODAY'S DATE: _____

SHIPPED DATE: _____

THIS ORDER IS ACKNOWLEDGED WITH THE UNDERSTANDING THAT THE ABOVE PURCHASE ORDER IS IN ACCORDANCE WITH METLAB'S TERMS AND CONDITIONS OF SALE AS SUBMITTED AT THE TIME OF THE ABOVE QUOTATION.



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID PO17601

Purchase Order Date 8/2/2012

PO Print Date 8/2/2012

Page Number 1 of 2

Order From :

VU-MET001

METLAB
1000 E. MERMAID LANE
WYNDMOOR, PA 19038
USA

Contact Name
Vendor Phone 215-233-2600
Vendor Fax 215-233-5653
Vendor Account Nbr

Buyer Brigitte Golden
Requisition Nbr
Tax Resale Nbr 10127-2607
Terms Net 30
Currency USD
FOB Destination-Collect

Ship To : DART AEROSPACE LTD 1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Line Nbr	Reference Revision ID Vendor Part Number	Description/ Mfg ID	Req Date/ Taxable	Req Qty/ Unit of Measure	Ship Method	Unit Price	Extended Price
1	86987 ✓	D350-748-241TRN Crosstube	8/13/2012 Yes	1.00	Day & Ross ppd	\$205.0000	\$205.00
		Special Inst: HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-1C) SAND BALST TUBE AFTER HEAT TREAT CERTIFICATIONS					
2	86988 ✓	D350-748-241TRN Crosstube	8/13/2012 Yes	1.00	Day & Ross ppd	\$205.0000	\$205.00
		Special Inst: SAME AS ABOVE					
3	84668 ✓	D350-748-241TRN Crosstube	8/13/2012 Yes	1.00	Day & Ross ppd	\$205.0000	\$205.00
		Special Inst: SAME AS ABOVE					

8/12/8-21

No substitution or deviation without
consent.

Certificate of Conformity or Material
Certification required - YES NO

Change Nbr: 1

Change Date: 8/2/2012



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO17601**

Purchase Order Date 8/2/2012

PO Print Date 8/2/2012

Page Number 2 of 2

Order From :

VU-MET001

METLAB
1000 E. MERMAID LANE
WYNDMOOR, PA 19038
USA

Contact Name

Vendor Phone

215-233-2600

Vendor Fax

215-233-5653

Vendor Account Nbr

Buyer

Brigitte Golden

Requisition Nbr

Tax Resale Nbr

10127-2607

Terms

Net 30

Currency

USD

FOB

Destination-Collect

4	84672 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.0
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Yes

Special Inst: Same As above

5	84669 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.0
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Yes

Special Inst: Same as above

6	84677 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.0
---	---------	------------------------------	-----------	------	----------------	------------	---------

Yes

Special Inst: Same as above

PO Total: \$1,230.0

8/28-21

Change Nbr: 1

Change Date: 8/2/2012

No substitution or deviation without consent.

Certificate of Conformity or Material Certification required - YES NO

Brigitte Golden

From: Mark Podob <mpodob@metlabheattreat.com>
Sent: Thursday, August 02, 2012 10:15 AM
To: Doris Funches; Dan Krackovic; Eugene Roberts
Cc: Brigitte Golden
Subject: FW: New PO17601 from Dart
Attachments: D350-748-241-RevF.pdf; PO17601 Metlab.pdf

Importance: High

New P.O. from Dart.

Mark Podob
Vice President, Marketing and Sales
Metlab
1000 E. Mermaid Lane
Wyndmoor, PA 19038
215-233-2600 Ext. 232
(F) 215-233-5653
mpodob@metlabheattreat.com

This message and any attachments are intended for the individual or entity named above. If you are not the intended recipient, please do not forward, copy, print, use or disclose this communication to others; also please notify the sender replying to this message and then delete it from your system.

From: Brigitte Golden [<mailto:bgolden@dartaero.com>]
Sent: Thursday, August 02, 2012 9:59 AM
To: Mark Podob
Cc: 'Linda Lacelle'
Subject: New PO17601 from Dart
Importance: High

Good Morning Mark!
Please find attached new PO for 6 crosstubes to be heat treated.
They are leaving today with Day & Ross this afternoon, tracking # OTT 19872092

Thank You

Brigitte Golden
Order Processing
DART AEROSPACE Ltd.
1270 Aberdeen Street
Hawkesbury Ontario
Canada K6A 1K7
Tel: (613) 632-5200 Ext 224
Fax: (613) 632-1053
bgolden@dartaero.com



Please consider your environmental responsibility before printing this e-mail

From: Brigitte Golden [<mailto:bgolden@dartaero.com>]
Sent: Friday, July 27, 2012 11:19 AM
To: 'mpodob@metlabheattreat.com'
Cc: 'Linda Lacelle'
Subject: PO17555 from Dart

Please find attached the PO
Thank You

From: Linda Lacelle [<mailto:llacelle@dartaero.com>]
Sent: Thursday, July 26, 2012 2:36 PM
To: mpodob@metlabheattreat.com
Cc: Brigitte Golden
Subject: more tubes

Hi Mark,

We will be shipping out 9 tubes tomorrow for heat treat. Another batch should follow end of next week. As always, I need these asap..

Thx!

Linda Lacelle
Production manager
Dart Aerospace



Commercial Invoice:145

Ship From: Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Canada
Tel # 1.613.632.5200
GST # RT101272607

Ship To: METLAB
1000 E Mermaid LN
Wyndmoor
PA, 19038 US

ATTN: Mark Podob
PH# 215 233 2600

Date: 2-Aug-12 **P.O. # 17555**

Broker: UPS SCS
PH#: 800 443-6379

Ship Via: Day & Ross PPD **FOB:Origin**

Item	Part Number / Product Description	Tariff Class.	Quantity	Unit Price	Total
1	Crosstube D350-748-241	8803.20	6	\$ 1,250.00	\$ 7,500.0
2					
3					
4					

All Prices are in US Dollars

*All of the above parts were made in Canada unless otherwise indicated
THIS IS A CUSTOMS INVOICE ONLY*

Sub Total \$7,500.00

Total \$7,500.00

Amount Due: \$7,500.00

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Canada
Tel.: 1.613.632.5200
Fax: 1.613.632.1185
GST # RT101272607



STRAIGHT BILL OF LADING - 1.866.DAY.ROSS

OTT 1987209 2



NIR R-500048-5

BILLER INIT. (INITIALES PROPOSÉES) À LA FACTURATION	OFF UNIT DÉCHARGÉ DU VÉHICULE NO.	NO. OF PIECES QUANTITÉ DE MORCEAUX	INIT.
	ON UNIT CHARGÉ DANS VÉHICULE NO.	NO. OF PIECES QUANTITÉ DE MORCEAUX	INIT.

MONTH 08	DATE DAY 2	YEAR 12	LEVEL OF SERVICE <input type="checkbox"/> GENERAL	C.O.D. AMOUNT CURRENCY: <input type="checkbox"/> CDN <input type="checkbox"/> U.S.	Pick Up Information Telephone Number: Contact Name: Ready Date & Time: Closing Time:
<input type="checkbox"/> PRIVATE RESIDENCE PICK UP <input type="checkbox"/> PRIVATE RESIDENCE DELIVERY <input type="checkbox"/> PALLETS BEING RETURNED <input type="checkbox"/> HAZARDOUS GOODS* <input type="checkbox"/> APPOINTMENT DELIVERY (DATE/TIME)			<input type="checkbox"/> TAILGATE PICK UP <input type="checkbox"/> HEATED SERVICE <input type="checkbox"/> TRADE SHOW PU <input type="checkbox"/> INBOND		
*this shipment contains dangerous goods as set out in the attached shipper's declaration				REQUESTED BY: <input type="checkbox"/> SHIPPER <input type="checkbox"/> CONSIGNEE <input type="checkbox"/> BILL TO <input type="checkbox"/> THIRD	EMAIL:

SHIPPER DAY & ROSS ACCT. NO. 038326 TEL NO. 613 632 5200 SHIPPER'S NAME DART Aerospace PICK UP ADDRESS 1270 Aberdeen St Hawkesbury ON K6A 1K7	CONSIGNEE DAY & ROSS ACCT. NO. TEL NO. 215 233 CONSIGNEE'S NAME Metlap DELIVERY ADDRESS Mark Podob 1000 E. Mermaid Ln Wyndmoor PA 190
CITY PROV. COUNTRY POSTAL CODE	CITY PROV. COUNTRY POSTAL CODE

METHOD OF PAYMENT <input checked="" type="checkbox"/> PREPAID <input type="checkbox"/> COLLECT <input type="checkbox"/> CASH IN ADVANCE AMOUNT CURRENCY: <input type="checkbox"/> CDN <input type="checkbox"/> THIRD PARTY BILL TO ACCOUNT NUMBER <input type="checkbox"/> VISA <input type="checkbox"/> M.C. <input type="checkbox"/> AMX EXPIRY DATE CARD NO.	OTHER BILL TO PARTICULARS BILL TO: BILL TO ADDRESS GST: CITY PROV. COUNTRY POSTAL CODE
--	--

SPOT QUOTE NO.	ROUTING OR SPECIAL INSTRUCTIONS	MAXIMUM LIABILITY OF \$2.00/LB OR \$4.41/KG COMPUTED ON THE TOTAL ACTUAL WEIGHT UNLESS DECLARED VALUATION STATES OTHERWISE. PLEASE SEE ADDITIONAL TERMS AND CONDITIONS ON REVERSE.		
NO. OF PCS.	DESCRIPTION OF ARTICLES AND SPECIAL MARKS	WEIGHT <input checked="" type="checkbox"/> LBS <input type="checkbox"/> KGS	DECLARED VALUE <input type="checkbox"/> CDN <input type="checkbox"/> U.S.	DIMENSIONS
3	Aircraft Parts CROSSBRED cardboard cartons	180		127x13x7
ALL USED HOUSEHOLD GOODS AND PERSONAL EFFECTS SHIPPED AT SHIPPER'S RISK OF DAMAGE				

The uniform TERMS OF CARRIAGE apply to this BILL OF LADING. (See Term and Condition No. 1)

NOTICE OF CLAIM must be submitted in writing within sixty (60) days of delivery. (See Term and Condition No. 2)

The carrier's maximum liability is limited by the TERMS OF THE Bill of Lading. (See Term and Condition No. 5)

SHIPPER'S REF. NO.	PO 17601
SHIPPER'S SIGNATURE	Brigitte Golden
PRINT	BRIGITTE Golden

PICK-UP DATE	08-02-2012	NO. OF PCS.	
DAY & ROSS DRIVER	Dennis	PURCHASE ORDER	
POWER NO.	270604	TRAILER NO.	1

~~MITCHELL H. VILG 1109~~

D 350 X-TUBE CUFF MEASURMENTS AFTER HEAT TREATING

	TYPE	BATCH #	SIDE A TWO READINGS	SIDE B TWO READINGS
1	AFT	84672	2.251"/2.235"	2.257"/2.244"
2	AFT	84677	2.239"/2.245"	2.239"/2.251"
3	AFT	84669	2.238"/2.244"	2.232"/2.255"
4	AFT	84668	2.254"/2.238"	2.256"/2.240"
5	AFT	84675	2.248"/2.238"	2.251"/2.240"
6	AFT			
7	AFT			
8	AFT			
9	AFT			
10	AFT			
11				
12	FWD	84660	2.257"/2.233"	2.253"/2.228"
13	FWD			
14	FWD			
15	FWD			
16	FWD			
17	FWD			
18	FWD			
19	FWD			
20	FWD			
21	FWD			
22	FWD			
23	FWD			

